AGJuggler Castle Highmoore: Virtual Reality for the Access Grid™

Dioselin Gonzalez
Laura Arns

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Outline

- Definitions
- The Problem
- Related work
- AGJuggler
- Demo
- Findings
- Conclusions and future work

Definitions

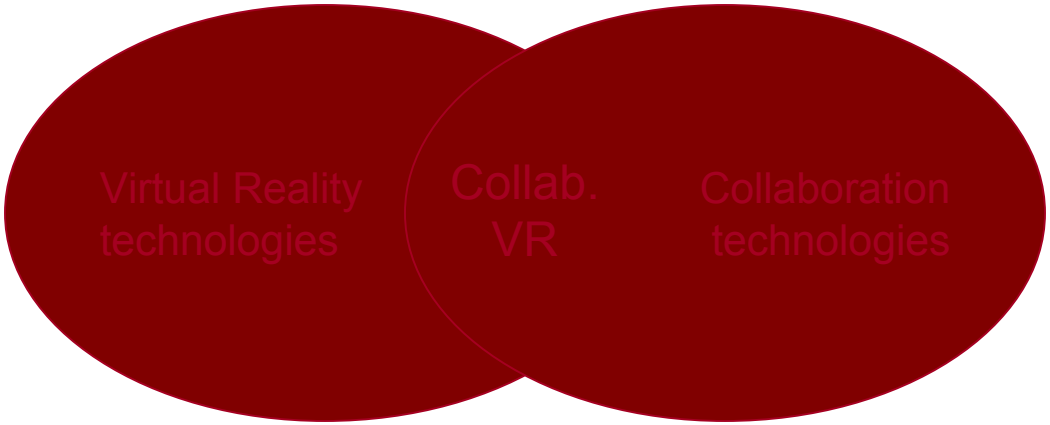
- Virtual Reality
- Avatar
- VRJuggler
- OpenSceneGraph

Motivations

- Improved sense of presence
- Synchronous collaboration
- Real time interaction, no master/slave approach
- … and no customizable solution available

The goal

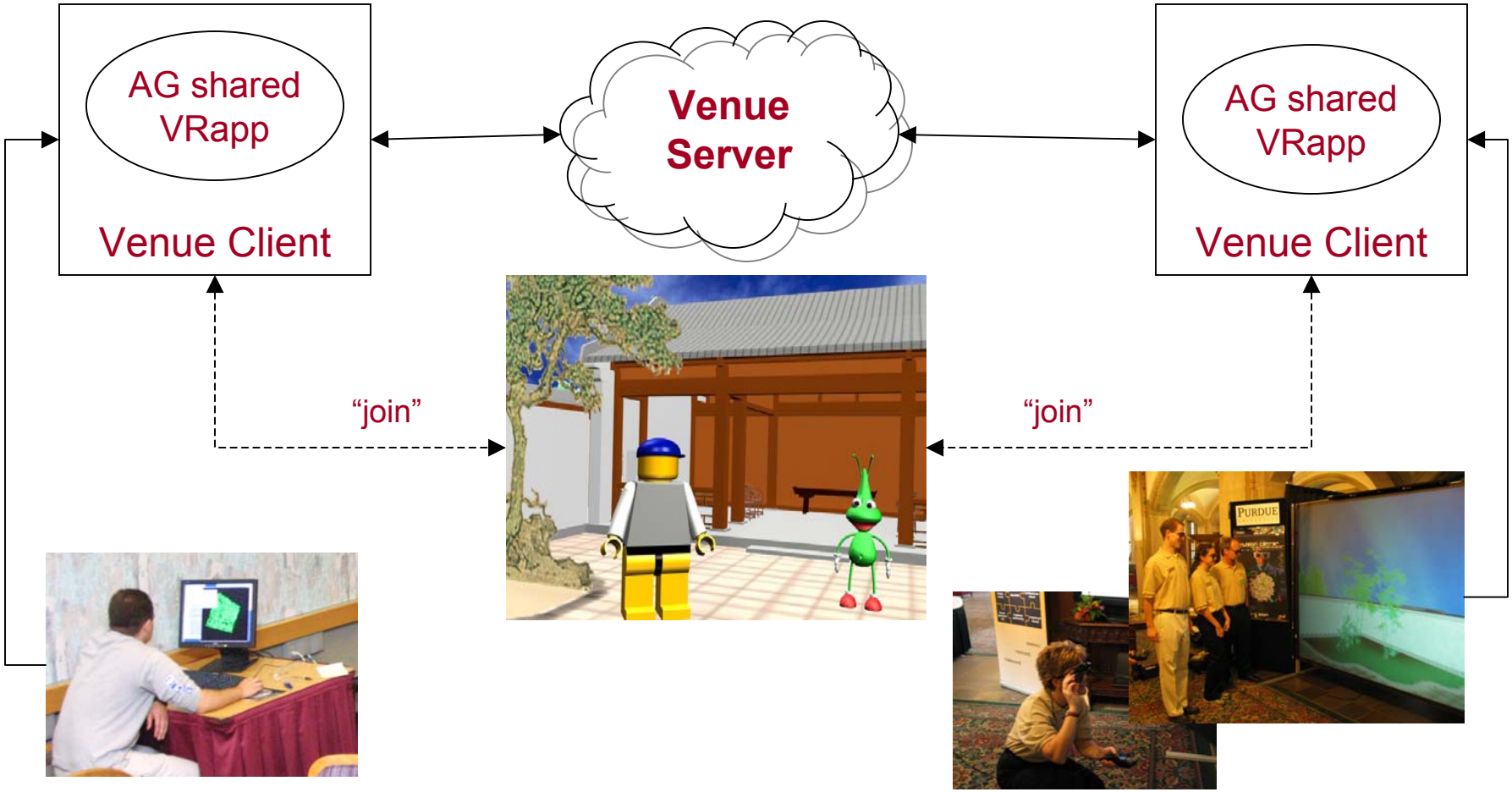
- Make VR tools available for collaborative work
- Enrich collaborative experiences



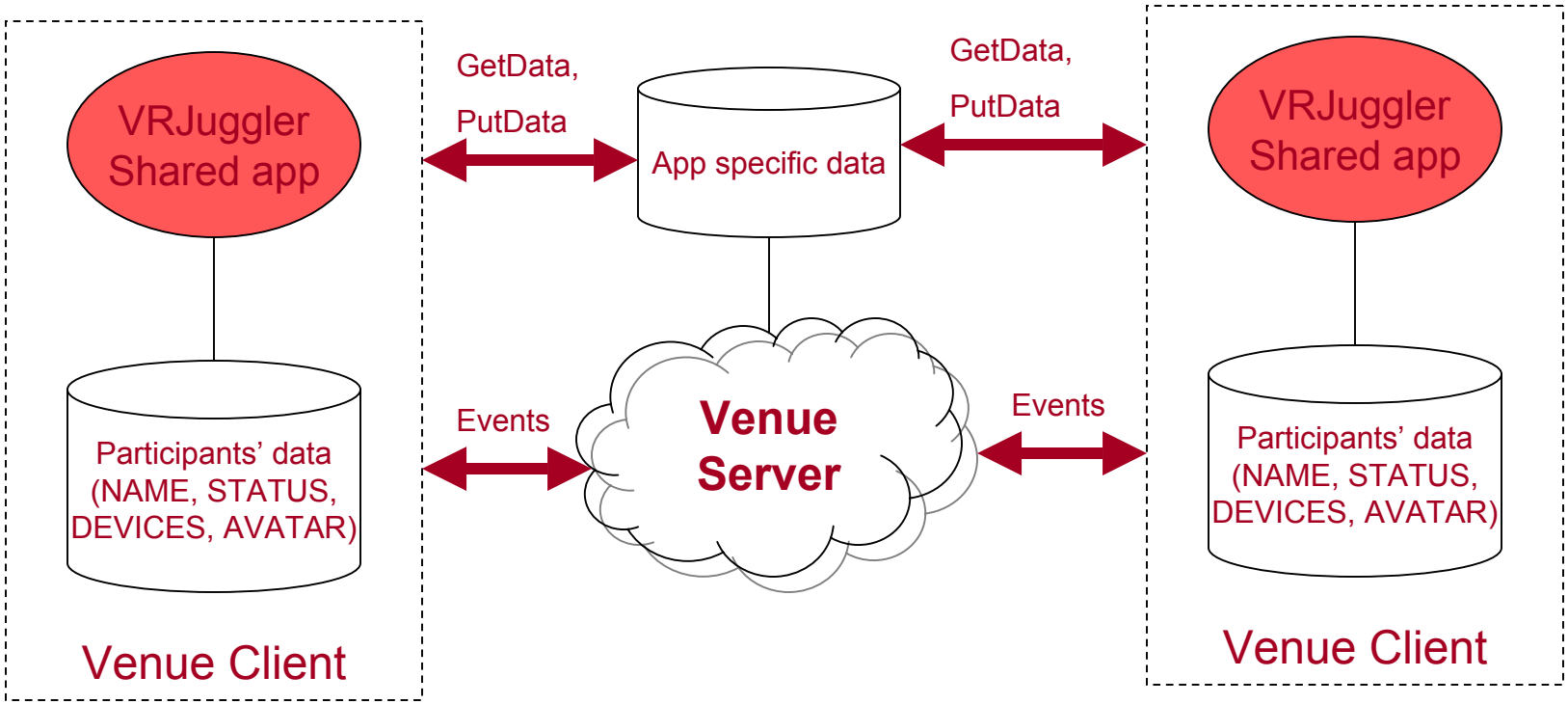
Related work

- CAVEav to capture video from display devices and stream it into the AG
- AGAVE and TeraVision
- VNC to distribute visualization

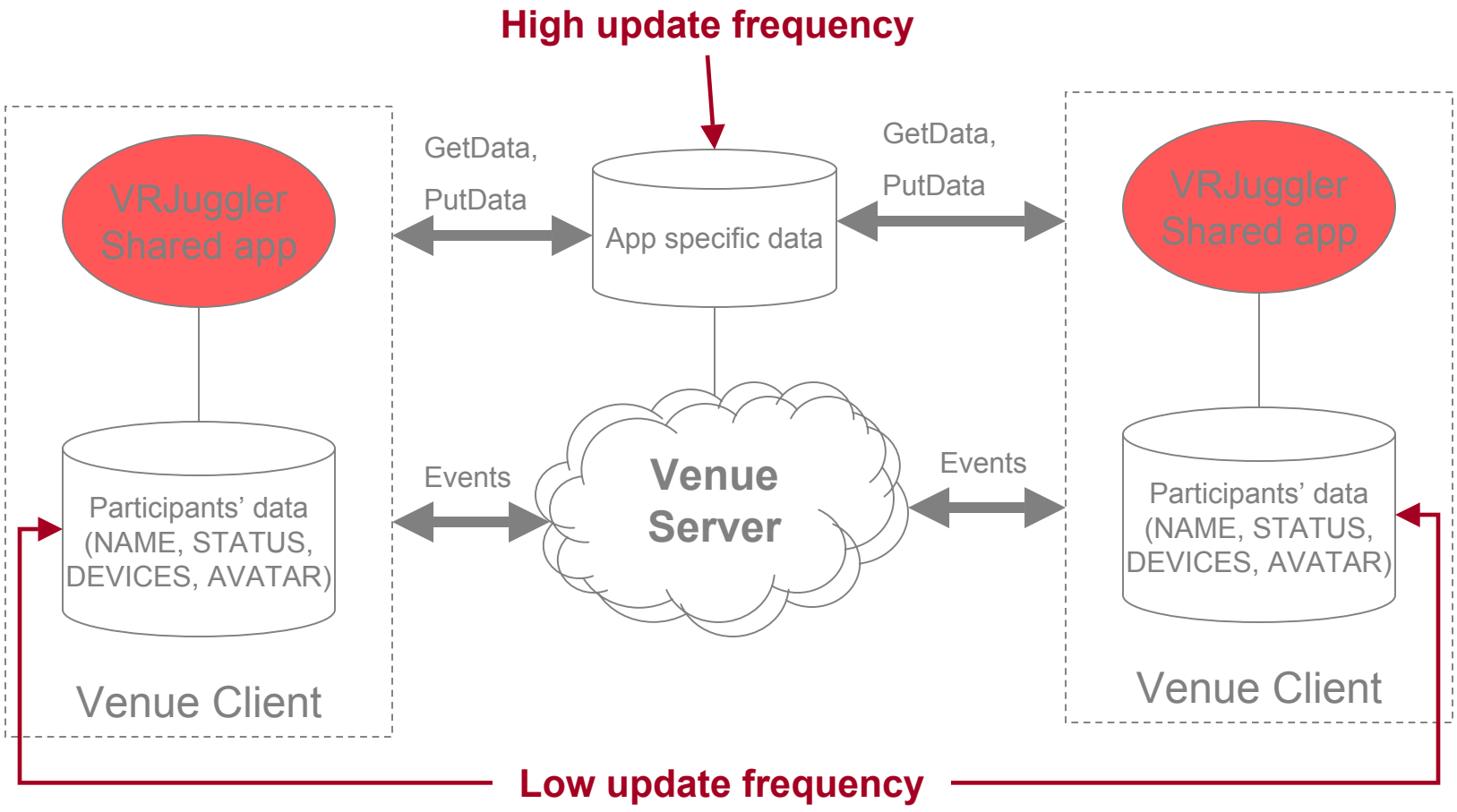
Proposed scenario



Implementation

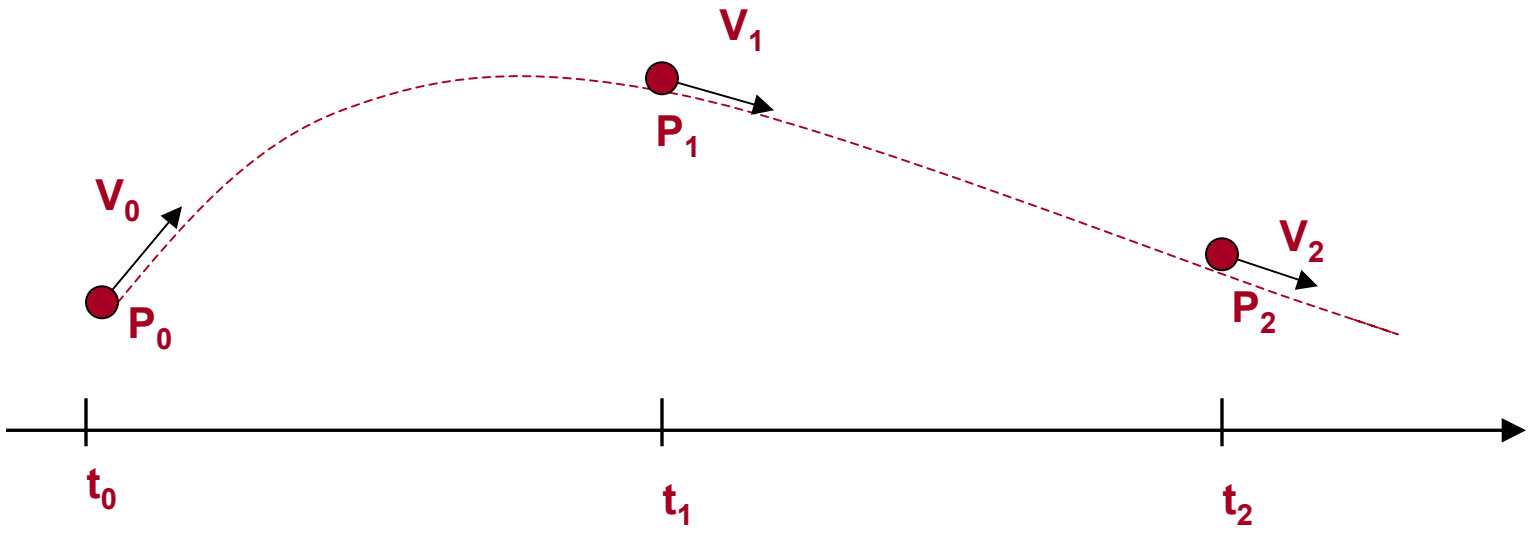


Implementation

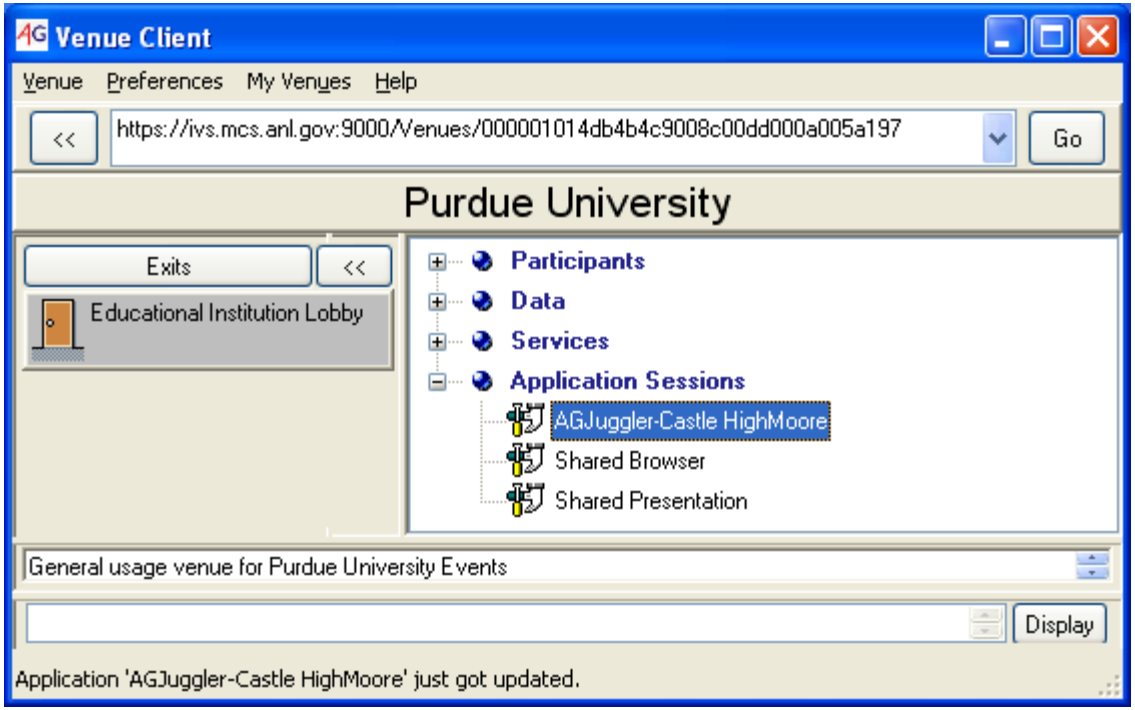


Position prediction and update

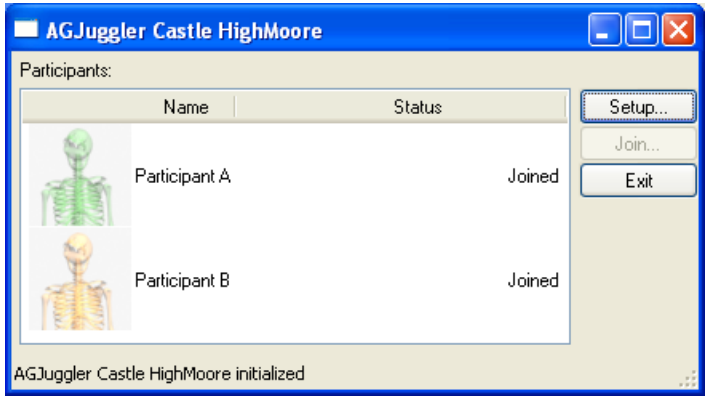
- Transmit both position and velocity

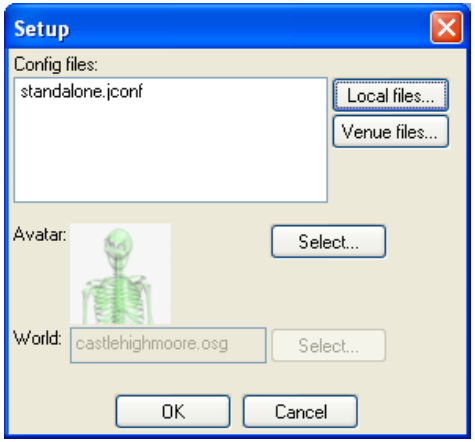


Demo

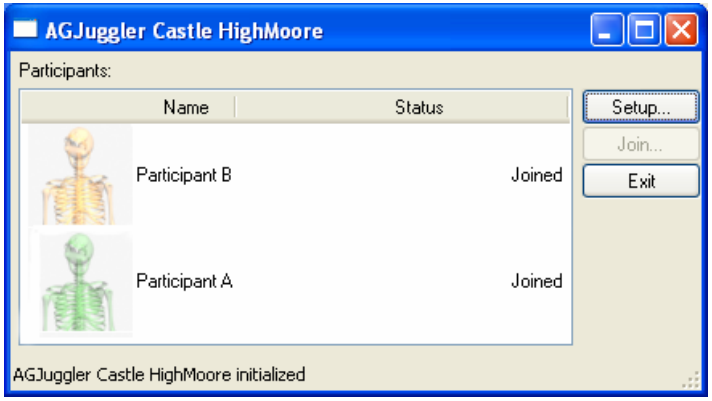

Venue Client
Venue
Preferences
My Venues
Help
<<
https://ivs.mcs.anl.gov:9000/Venues/000001014db4b4c9008c00dd000a005a197
Go
Purdue University
Exits
<<
Educational Institution Lobby
Participants
Data
Services
Application Sessions
AGJuggler-Castle HighMoore
Shared Browser
Shared Presentation
General usage venue for Purdue University Events
Display
Application 'AGJuggler-Castle HighMoore' just got updated.

Demo


AGJuggler Castle HighMoore
Participants:
Name
Status
Setup...
Join...
Exit
Participant A
Joined
Participant B
Joined
AGJuggler Castle HighMoore initialized


Setup
Config files:
standalone.jconf
Local files...
Venue files...
Avatar:
Select...
World:
castlehighmoore.osg
Select...
OK
Cancel

Demo


AGJuggler Castle HighMoore
Participants:
Name
Status
Participant B
Joined
Participant A
Joined
Setup...
Join...
Exit
AGJuggler Castle HighMoore initialized

Findings

- Bandwidth use:
  - Average upload usage of 2.1k/sec and a maximum of 6.3k/sec.
- High network latency, so position synchronization is not completely satisfactory

Why is this a valuable contribution?

- Richer collaborative experience by real time interaction + “follow” option
- AGJuggler is a customizable solution
- Highly flexible: platform independent + many tracking systems (including simulator mode)

Why is this a valuable contribution?

- AGJuggler is a customizable solution
- Richer collaborative experience by real time interaction + “follow” option
- No frames or video streams transmitted!

Conclusions and Future Work

- Synchronization issue: High update frequency + high network latency
- Avatars animation, video avatars
- Integration with other tools: shared board in the 3D world, shared presentation, …
- Operations, e.g. pick objects and take ownership.
- Python C/C++ API for existing C++ applications

Thanks

- Jack Moreland and Justin Heisler: environment modeling and original app.
- Jack Moreland: avatars modeling
- Jennett Tillotson, Dwight McKay

Questions?

Thanks!

dioselin@purdue.edu
http://people.envision.purdue.edu/~dioselin/AGJuggler/